

image sensor (that is, an imaging device) converting an image of a subject incident thereto through the optical system into electrical signals. Further still, the optical imaging system may include a gap maintaining member adjusting a gap between lenses.

[0057] First to seventh lenses may be formed of materials having a refractive index different from that of air, for example, the first to seventh lenses may be formed of plastic or glass. At least one of the first to seventh lenses may have an aspherical shape. As an example, only the seventh lens of the first to seventh lenses may have the aspherical shape. In addition, at least one surface of all of the first to seventh lenses may be aspherical. Here, an aspherical surface of each lens may be represented by the following Equation 1:

$$Z = \frac{cr^2}{1 + \sqrt{1 - (1+k)c^2r^2}} + Ar^4 + Br^6 + Cr^8 + Dr^{10} + Er^{12} + Fr^{14} + Gr^{16} + Hr^{18} + Jr^{20}. \quad [\text{Equation 1}]$$

[0058] In Equation 1, c is the inverse of a radius of curvature of the lens, k is a conic constant, r is a distance from a certain point on an aspherical surface of the lens to an optical axis, A to J are aspherical constants, and Z (or SAG) is a distance between the certain point on the aspherical surface of the lens at the distance Y and a tangential plane meeting the apex of the aspherical surface of the lens.

[0059] An optical imaging system may include seven lenses, a filter, an image sensor, and a stop. Next, the above-mentioned components will be described.

[0060] The first lens may have refractive power, for example, the first lens may have negative refractive power.

[0061] At least one surface of the first lens may be concave, for example, an image-side surface of the first lens may be concave.

[0062] The first lens may have a spherical surface, such as, both surfaces of the first lens being spherical. The first lens may be formed of a material having high light transmissivity and excellent workability, for example, the first lens may be formed of glass. However, a material of the first lens is not limited to glass and may be another material such as plastic.

[0063] The second lens may have refractive power, such as, the second lens having positive refractive power.

[0064] At least one surface of the second lens may be convex, for example, both surfaces of the second lens may be convex.

[0065] The second lens may have an aspherical surface, such as, an object-side surface of the second lens being aspherical. The second lens may be formed of a material having high light transmissivity and excellent workability, for example, the second lens may be formed of plastic. However, a material of the second lens is not limited to plastic and may be formed of other materials including glass.

[0066] The third lens may have refractive power, for instance, the third lens may have positive or negative refractive power.

[0067] One surface of the third lens may be convex, such as, an image-side surface of the third lens being convex.

[0068] The third lens may have an aspherical surface, for example, an image-side surface of the third lens may be aspherical. The third lens may be formed of a material having high light transmissivity and excellent workability, and may be formed of other materials including plastic.

However, a material of the third lens is not limited to plastic and could be formed of glass.

[0069] The fourth lens may have refractive power, such as, the fourth lens having positive or negative refractive power.

[0070] The fourth lens may have a meniscus shape, for example, an object-side surface of the fourth lens may be concave.

[0071] The fourth lens may have an aspherical surface, such as, both surfaces of the fourth lens being aspherical. The fourth lens may be formed of a material having high light transmissivity and excellent workability, for example, like being formed of plastic. However, a material of the fourth lens is not limited to plastic and may be other materials including glass.

[0072] The fifth lens may have refractive power, for example, the fifth lens may have positive refractive power.

[0073] At least one surface of the fifth lens may be convex, for example, both surfaces of the fifth lens may be convex.

[0074] The fifth lens may have an aspherical surface, for example, both surfaces of the fifth lens may be aspherical. The fifth lens may be formed of a material having high light transmissivity and excellent workability, for example, the fifth lens may be formed of plastic. However, a material of the fifth lens is not limited to plastic, for example, the fifth lens may be formed of glass.

[0075] The sixth lens may have refractive power, for example, the sixth lens may have negative refractive power.

[0076] The sixth lens may have a meniscus shape, for example, an image-side surface of the sixth lens may be concave.

[0077] The sixth lens may have inflection points, for example, the inflection points may be formed on both surfaces of the sixth lens.

[0078] The sixth lens may have an aspherical surface, for example, both surfaces of the sixth lens may be aspherical. The sixth lens may be formed of a material having high light transmissivity and excellent workability, for example, the sixth lens may be formed of plastic. However, a material of the sixth lens is not limited to plastic, for example, the sixth lens may be formed of glass.

[0079] The seventh lens may have refractive power, for example, the seventh lens may have positive or negative refractive power.

[0080] The seventh lens may have a meniscus shape, for example, an image-side surface of the seventh lens may be concave.

[0081] The seventh lens may have inflection points, for example, the inflection points may be formed on both surfaces of the seventh lens.

[0082] The seventh lens may have an aspherical surface, for example, both surfaces of the seventh lens may be aspherical. The seventh lens may be formed of a material having high light transmissivity and excellent workability, for example, the seventh lens may be formed of plastic. However, a material of the seventh lens is not limited to plastic, for example, the seventh lens may be formed of glass.

[0083] The lenses of the optical imaging system configured as described above may be grouped into two lens groups, for example, the first lens and the second lens may form a first lens group, and the third to seventh lenses may form a second lens group. The first lens group may be fixed to an object side. The second lens group may be movable, for